

CLAIMS

1. Process for the preparation of a block copolyetherester elastomer comprising polyester blocks and poly(alkylene oxide) polyol blocks, wherein at least one aromatic dicarboxylic acid or an ester-forming derivative thereof, at least one alkylene diol, and a poly(alkylene oxide) polyol, comprising an poly(propylene oxide), end capped with ethylene oxide, are esterified, characterized in that:
 - the poly(alkylene oxide) polyol has an ethylene oxide content of between 22 and 90% by weight, relative to the total weight of the poly(alkylene oxide) polyol, and
 - the poly(alkylene oxide) polyol has an unsaturation content, being the total content of vinyl and allyl groups, of less than 35 meq per kg poly(alkylene oxide) polyol.
2. Process according to claim 1, wherein the poly(alkylene oxide) polyol has an Mn of between 2500 and 5000 g/mol.
3. Process according to claim 1 or 2, wherein the poly(alkylene oxide) polyol has an ethylene oxide content between 30 and 70 % by weight, relative to the total weight of the poly(alkylene oxide) polyol.
4. Process according to any of the claims 1-3, wherein the poly(alkylene oxide) polyol has an unsaturation content, being the total content of vinyl and allyl groups, of less than 30 meq per kg, preferably less than 25 meq per kg poly(alkylene oxide) polyol.
5. Process according to any of the claims 1-4, wherein
 - a) the poly(alkylene oxide) polyol has an ethylene oxide content of between 30 and 70 % by weight,
 - b) the poly(alkylene oxide) polyol has an unsaturation content, being the total content of vinyl and allyl groups, of less than 25 meq per kg poly(alkylene oxide) polyol, and
 - c) the poly(alkylene oxide) polyol has an Mn of between 2500 and 5000 g/mol.
6. Process according to any of the claims 1-5, wherein in the block copolyetherester:
 - d) the ratio by weight of poly(alkylene oxide) polyol/aromatic dicarboxylic acid or an ester-forming derivative thereof is between 60/40 and 90/10;
 - e) the average degree of polymerization of the polyester block is at least 3.5; and
 - f) the block copolyetherester elastomer has an Mn of at least 25,000 g/mol.

7. Block copolyetherester elastomer comprising polyester blocks and poly(alkylene oxide) polyol blocks, obtainable by esterification of at least one aromatic dicarboxylic acid or an ester-forming derivative thereof, at least one alkylene diol, and a poly(alkylene oxide) polyol, comprising a poly(propylene oxide) end capped with ethylene oxide, characterized in that
- 5 a) the poly(alkylene oxide) polyol has an ethylene oxide content of between 22 and 90 % by weight;
- b) the block copolyetherester elastomer has a an unsaturation content, being the total content of vinyl and allyl groups, of less than 35 meq per kg of the
- 10 poly(alkylene oxide) polyol;
- c) the poly(alkylene oxide) polyol has a Mn of between 2500 and 5000 g/mol;
- d) in the block copolyetherester elastomer the ratio by weight of poly(alkylene oxide) polyol/ aromatic dicarboxylic acid or the ester-forming derivative thereof is between 50/50 and 90/10;
- 15 e) the average degree of polymerization of the polyester block is at least 3.5; and
- f) the block copolyetherester elastomer has an Mn of at least 25,000 g/mol.
8. A block copolyetherester elastomer according to claim 7, wherein the alkylene diol is 1,4-butene diol.
- 20 9. A block copolyetherester elastomer according to claim 7 or 8 wherein the aromatic dicarboxylic acid or the ester-forming derivative thereof is butylene terephthalate.
10. A block copolyetherester elastomer according to any of claims 7-9, wherein the poly(alkylene oxide) polyol has an Mn of between 3000 and 5000.
- 25 11. A block copolyetherester elastomer according to any of claims 7-10 having a vinyl content of less than 15 meq per kg of the poly(alkylene oxide) polyol.
12. A block copolyetherester elastomer according to any one of claims 7-11 having an Mn of at least 35,000 g/mol.
13. Composition comprising a block copolyetherester elastomer according to any one of claims 7-12 and at least one additive.
- 30 14. Use of a block copolyetherester elastomer according to any one of claims 7-12 in an elastic fiber or film.
15. Product comprising at least one block copolyetherester elastomer according to any one of claims 8-13, the product preferably being an elastic fiber or film.